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ABSTRACT

A study examined 20 New Jersey daily newspapers to assess the impact of readability on circulation. It was hypothesized that the circulation of a newspaper would be inversely related to the readability level of its contents; that is to say, as reading material becomes harder to read, fewer people will read it. News pieces (divided into hard news, soft news, and local news) for a single random date in 1986 were selected and studied. Wire service news, which is written on a single level and which acted as a control, was eliminated. The Flesch readability formula was applied to 12 articles from each newspaper, 4 from each category, and, to assess the consistency of the Flesch formula, a second readability formula, the Fry Method, was also applied. The hypothesis was not supported. Results indicated no significant relationship between readability level and circulation level. Findings showed that, in general, people do not choose to read a newspaper based on the level of difficulty on which it is written. (Tables of data are included, and appendixes of newspaper circulation data and the Fry Readability Method data are attached, as well as a list of references.) (NKA)

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# THE CORRELATION BETWEEN READABILITY AND CIRCULATION IN REGARD TO THE TWENTY-SIX DAILY NEWSPAPERS OF NEW JERSEY

RISA COTTLER

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## DEFINITION OF TERMS

There are two terms which will be seen throughout the following pages. Definition of these terms is necessary for the understanding of the following material.

Circulation, the object of our study, is defined as the average number of copies of a newspaper sold over a given period of time (Merriam-Webster, 1984). It does not take into account the number of secondary readers.

The study will look at a relationship between circulation and readability. Readability is the level of difficulty associated with reading the written content of a newspaper.

While new terms will be used within the following pages, the aforementioned are the basis of this study.

## REVIEW OF LITERATURE

Taher Razik asserts that the level of readability significantly affects the reader's choice of reading material, reading speed and degree of comprehension (Razik, 1969).

Rudolph Flesch, having come to a conclusion similar to Razik's at least twenty years earlier, further developed this assertion. He found that any reader knows he can understand some materials more than others. Flesch also found "that people don't really like to read things they can just barely understand; they prefer reading matter where they don't even feel any effort in reading (Flesch, 1946)." In order to comply with the wishes of the audience, Flesch suggests that a writer should not concentrate on writing what a person wants to read, but he should write what he wants to say. The secret here is in writing that which one wants to say in the form that is most likely to appeal to the audience, and that form is based on simplicity (Flesch, 1949).

This is according to Rudolph Flesch, who in 1946 originated a formula to determine the actual education-level of any printed material. After studying the results obtained by applying his formula, Flesch asserts that "if one were to try to find what books, magazines and newspapers people not only can, but do read, he would have to go about one notch down the (ability) scale (Flesch, 1946)." Flesch suggests that if an editor or a

writer wants to widen his audience and to reach readers with less education, he will have to simplify his style (Flesch, 1949).

Donald Murphy, editor of Wallace's Farmer and Iowa Homestead, found that he could increase reader-interest from 45% to 66% by simplifying an article. He wrote two versions of an article, one version more difficult than the other. The versions were distributed randomly to two different groups of subscribers to the magazine. This was actually done with two different articles. Subscribers read the easier versions 45% and 66% more than each of the harder versions (Murphy, 1947).

Readership (circulation) is a large factor in the decision as to which level a writer should try to appeal. Concern over media readership has drawn increasing attention in recent years as circulation figures continue to drop and publication costs rise (Fowler and Smith, 1982). Consequently, readability formulas have become more popular. "The formulas facilitate the matching of message construction to the education-level necessary to comprehend such written communications (Fowler and Smith, 1982)," making it possible for editors to see whether material is digestible and hence comprehensible to more readers. The 1940s saw the birth of three such formulas.

First, the original Flesch formula was created in 1946. A "good score," which stems from readable writing, can be obtained by using short words and short sentences (Kearl, 1948).

Then there is the Dale-Chall formula which is also concerned with sentence length, but also with the proportion of hard words. This formula relies on a list of three thousand words well known to a test group of fourth-grade students. If a word in the piece to which the formula is being applied is not on the list, it is considered difficult (Kearl, 1948).

Finally, Flesch revised his formula in 1949. This formula has two parts: One which determines human interest and the other the reading ease score. The former part of the formula is based on the number of personal words and personal sentences within the given content (Kearl, 1948).

There are a number of other formulas which can be used to determine reading ease. Each of these and the aforementioned formulas deals with writing style. There are those people, however, who feel that such formulas promote the tampering with creativity and hence offer few positive ramifications.

Some writers feel that writing with arithmetic in mind stifles their creativity (Kearl, 1948). But George Holcomb, editor of International Woodworker, asserts that if used unwisely, such formulas for simplifying newswriting could serve to lower the average person's ability to think for himself. This might indicate that newspapers could fail in their responsibility to keep the public informed. He points out that there is a difference between writing only simple sentences and writing the

complex simply, and that editors might resort to the former instead of doing what a newspaper is supposed to and that is getting the essential news to the public. He suggests that newspaper editors would do well to 'spice up' ordinary news. "Perhaps they (editors) should require their reporters to write so as to stimulate readers to think and to be curious so that they're trapped into reading what they ordinarily might consider dull (Holcomb, 1954)." Holcomb argues that while some say that all these things have been the objectives of outstanding editors since newspapers began, it does not seem to be the practice (Holcomb, 1954).

While Holcomb warns of the dangers of using the readability formula, Bryant Kearl warns of its inefficiency. He says that to call something a "readability formula" is incorrect since there is no formula that even attempts to include all the elements that influence readership. He points out that the Flesch, Dale-Chall and any other readability formula deal only with writing style. He suggests that much more than writing style is involved in readability. Kearl refers to a list of elements of readability compiled in 1940 by Douglas Waples, Bernard Berelson and F.R. Bradshaw in What Reading Does to People. The list includes: the climate of opinion as it appears in a piece of writing, the character and purpose of the author, the format of the publication and whether the reader expects the content to be dull or exciting (Kearl, 1948).

W.S. Gray and Bernice Leary also suggest that there are four main influences on readability: the content, or what is being written about; the format, which includes photographs and type style; organization, which relies on headlines and sub-headings; and style, which refers to how and in what tone a piece is written (Kearl, 1948). Taking this into consideration, Kearl points out that such readability formulas are less than complete formulas for gauging readability (Kearl, 1948).

Kearl puts a lot of weight on the delivery of news in a newspaper. Also not in favor of readability formulas, Holcomb takes Kearl's argument even further and looks at the entire contents of a newspaper, not constrained to news. Holcomb recognizes that "in the competitive world of public information channels--newspapers, magazines, radio, books and television--editors are hard-pressed to attract and hold readers (Holcomb, 1954)." He suggests that stronger factors than reading ease determine circulation.

Many editors experiment with things such as comic strips, love columns, astrological forecasts, puzzles and advice columns. Editors will keep experimenting until they find the 'gimmicks' that attract and keep the most readers (Holcomb, 1954). After placing these puzzles and other attractions, the left-over space is earmarked for news. Holcomb's position seconds that of Robert L. Stevenson's, that readability and readership tend to rise with sensationalism (Stevenson, 1964). Since they are aware of this

relationship, "editors are constantly on the alert for the humorous, the odd, the sexy or other emotion-prodding items which they feel will catch the average reader's eyes (Holcomb, 1954)." Holcomb argues that by the time one considers the love columns, the puzzles, the soft news which is relatively easy to read and the sensational news, there is not a lot of space for straight news (Holcomb, 1954), much less straight news of any challenge to read.

After spending so much time discussing the goal of editors to appeal to a circulation, one tends to forget that the objects of this readership drive are human beings. Only Douglas Waples, Bernard Berelson and F.R. Bradshaw, as cited by Kearl, give any consideration to the expectations or motives of the reader. They say that a reader will respond to his expectations of whether material will be dull or exciting.

Taher Razik takes this further and points out that each reader has individual interests, educational experiences and intelligence levels which either directly or indirectly influence his choice of reading material (Razik, 1969). Not included in this list is the consideration of time availability. Which paper a person reads is often a function of the time constraints that person faces as related to the size and straightforward-ness of that newspaper.

We clearly have a dichotomy of opinions as to of what

circulation is a function. The opposing parties, Flesch and Guido H. Stempel III versus Holcomb, Kearl and Razik, each provide strong arguments which will be looked at further. These positions are outlined prior to our estimating the value of each.

Rudolph Flesch quoted Lyman Bryson, director of the Columbia University readability laboratory, as saying that the term readability includes three aspects of reading matter: comprehensibility, lucidity and appeal. As a prelude to his formula, Flesch explained that comprehensibility, as determined by sentence length and word length in terms of syllables, was the one of these three qualities with which his formula dealt (Kearl, 1948). Following is a test of readability using Flesch's formula. The extent to which comprehensibility of material is related to the readership of that material will be examined as it relates to the assertion by Guido H. Stempel III in 1981 that "the key to reaching more readers is making newspapers easier to read (Stempel, 1981)." This is in direct conflict with Holcomb's assertion that "it is the 'gimmicks' and the sensational items that gain great importance in the minds of the editors when trying to appeal to the readers (Holcomb, 1954)."

## HYPOTHESIS

There is obviously an extreme diversity of opinions among scholars concerning the determinants of circulation. Flesch, Razik, Murphy, Fowler and Smith and Stempel feel that reading ease is the method to use to appeal to readers. Holcomb, Kearl and Stevenson feel that there are a number of different factors more directly responsible for the circulation of newspapers.

The purpose of this report, then, is to study a population, in this case the twenty-six daily newspapers of New Jersey, in order to assess the impact of readability on circulation.

The assumption of this report is that there is a relationship between the circulation of a newspaper and the readability level of that newspaper. The hypothesis is that circulation is inversely related to the readability level of its contents; that is to say, as something gets harder to read, less people will read it, while as something gets easier more people will read it. The null hypothesis is that circulation is not inversely related to readability. The null hypothesis does not say that circulation and readability are positively related; rather it umbrellas two possibilities: first that the two are positively related and secondly that there is no relationship at all.

It is the intention of this report to conduct a readability study which will support either the hypothesis or the null hypothesis, preferrably the former; and in doing so will support the theories of either Flesch, Razik, Murphy, Fowler and Smith and Stempel or Holcomb, Kearl and Stevenson.

## METHODOLOGY

The sample population selected was the twenty-six daily newspapers of New Jersey. These include: The Asbury Park Press, The Atlantic City Press, The Bergen Record, The Bridgeton Evening News, The Burlington County Times, The Camden Courier Post, The Courier News, The Daily Register, The Elizabeth Daily Journal, The Gloucester County Times, The Home News, The Hudson Dispatch, The Jersey Journal, The Milville Daily, The Morristown Daily Record, The New Jersey Herald, The News Tribune, The North Jersey Advance, The Ocean County Observer, The Passaic Herald News, The Paterson News, The Star Ledger, Today's Sunbeam, The Trentonian, The Trenton Times and The Vineland Times Journal. In order to keep things as controlled as possible, it was decided to study the newspapers as issued on one random date, August 20, 1986. This disqualified The Camden Courier Post, as an issue from that particular date was unavailable.

The subject matter to be studied was news pieces, This did not include editorials or anything of opinion. In order to get a fair representation of news from each paper, it was separated into four categories; AP wire news, hard news, soft news and local news. AP news was eliminated since all news from this service is written on or near the same level and hence acted like a control.

For our purposes hard news refers to serious, factual, and timely stories about important topics (Fedler, 1984). It can be

news on the international, national or state level and can be about crime, fire, politics or government policies. This disqualified many of the newspapers because the only hard news that these newspapers carried was from the AP wire services. It was worth noting the number of newspapers that relied somewhat heavily on AP news for whatever reason, be it the size of the newspaper or financial limitations. These five were disqualified: The Trenton Times, The Bridgeton Evening News, The Elizabeth Daily Journal, The Burlington County Times and The Milville Daily.

For our purposes local news refers to hard news of a local nature; local news being confined to events within the circulation limits of the given newspaper (Fedler, 1984).

Soft news, in this study, refers to feature or human interest stories. Soft news can inform, but its main purpose is to entertain. Sports, cooking and entertainment are but a few topics found under the heading of soft news (Fedler, 1984).

Those are the three news categories defined in order to get a complete representation of the news in each paper. After a coder sorted the articles by category of news, we found a 92% agreement concerning article categorization. The Flesch readability formula was applied to twelve articles from each newspaper, four from each news categroy. This formula was selected by virtue of its concreteness and specificity. While

it is somewhat time consuming, one can clearly assert that there are a given number of words and syllables in a piece without having to use judgment. This formula, which was created by Rudolph Flesch in 1946 and revised in 1949 (Flesch, 1949), first dictates that one count out the first one hundred words in each sample. Overall we are dealing with two hundred and forty samples; twelve from each newspaper. Then, from that one-hundredth word, find the end of the nearest sentence, be it the sentence before the one with that word in it or the sentence that contains that word. Record the number of words up until that point. Count and record the number of syllables in that group of words. Combine the number of syllables for all four samples in each of the three categories and divide by the total number of sentences in each category. This gives you the average number of syllables per news category. Then figure the average sentence length for each category. Add the number of words in the four samples and divide by the total number of sentences. This gives you the average sentence length (Flesch, 1946). Now we are ready to find the "reading ease" score.

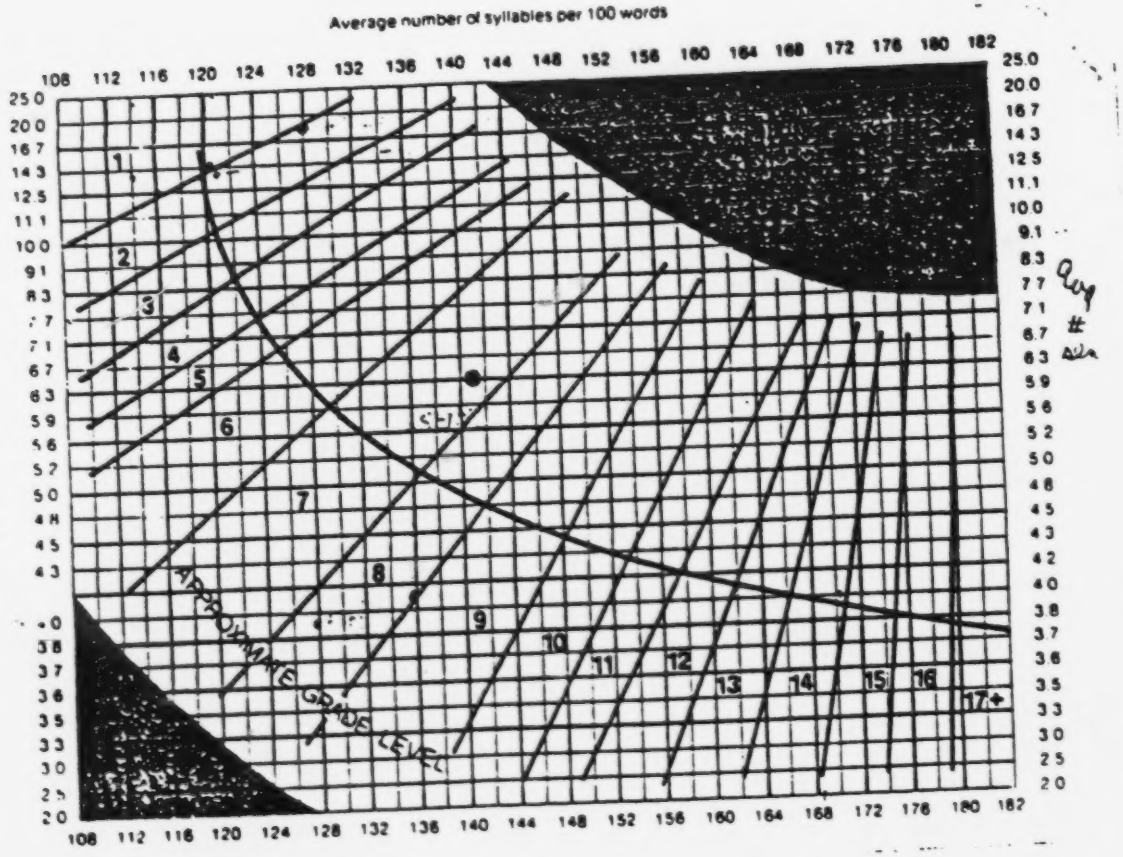
First, multiply the average sentence length by 1.015; then multiply the number of syllables by .846. Add these two products and subtract the sum from 206.835. This number is the reading ease score (Flesch, 1946). Check the following chart to

determine the difficulty and estimated reading levels.

| Description of Style | Reading Ease Score | Estimated Reading Grade |
|---|---|---|
| very easy | 90 to 100 | 5th grade |
| easy | 80 to 90 | 6th grade |
| faily easy | 70 to 80 | 7th grade |
| standard | 60 to 70 | 8th & 9th grade |
| fairly difficult | 50 to 60 | 10th - 12th grade |
| difficult | 30 to 50 | 13th - 16th grade |
| very difficult | 0 to 30 | college graduate |
| | | (Flesch, 1946) |

Table 1: Readability Level

A second readability formula was applied to each newspaper in order to assess the consistency of the first. This method, as presented by Edward Fry when a professor at the Rutgers University Reading Center, was chosen as a check by virtue of its simplicity. The method relies on average sentence length and average number of syllables found in a given news piece (Fry, 1968); we have already found this information for application of the Flesch formula. However, the Fry method involves plotting the two values of the two variables on a graph (Fry, 1968), as opposed to multiplying, adding and subtracting (Flesch, 1946). Following is Fry's graph.




Graph 1: Estimating Readability--Fry Method (Fry, 1968)

## RESULTS

The following table simplifies the results of applying Flesch's formula.

| Newspaper | Soft | Local | Hard | Overall |
|---|---|---|---|---|
| Courier News | 69 | 38 | 41 | 49/16th |
| Daily Register | 60 | 38 | 39 | 46/16th |
| Gloucester County Times | 67 | 38 | 30 | 45/16th |
| Vineland Times Journal | 54 | 39 | 44 | 46/16th |
| Bergen Record | 56 | 35 | 35 | 42/15th |
| New Jersey Herald | 60 | 33 | 27 | 40/15th |
| North Jersey Advance | 65 | 36 | 27 | 43/15th |
| Ocean County Observer | 62 | 38 | 29 | 43/15th |
| Trentonian | 66 | 47 | 21 | 45/15th |
| Asbury Park Press | 51 | 34 | 33 | 39/14th |
| Atlantic City Press | 56 | 33 | 24 | 38/14th |
| Home News | 48 | 43 | 25 | 39/14th |
| Hudson Dispatch | 48 | 36 | 23 | 36/14th |
| Jersey Journal | 51 | 31 | 25 | 36/14th |
| News Tribune | 59 | 26 | 29 | 38/14th |
| Passaic Herald News | 53 | 28 | 27 | 36/14th |
| Paterson News | 51 | 37 | 29 | 39/14th |
| Star Ledger | 53 | 33 | 29 | 38/14th |
| Morristown Daily Record | 44 | 36 | 21 | 34/13th |
| Today's Sunbeam | 55 | 31 | 20 | 35/13th |

Table 2: Readability by Category & Overall

The numbers in columns 2,3 and 4 represent the Flesch reading ease score. Column 5 is the average of these scores; it is also very close to the number obtained by applying the

Flesch formula to an entire newspaper, as opposed to averaging the scores of each category. Since this average is representative of the newspaper, it was this number that was used to determine the overall grade level of the corresponding newspaper, as also found in column 5. The Fry method was applied to each newspaper in order to ascertain the consistency of the Flesch method. There was 95% agreement. See Appendix A1-2.

We now need to demonstrate the relationship between readability level and circulation. Following is a table depicting this information.

| Newspaper | Overall Grade Level | Circulation |
|---|---|---|
| Courier News | 16 | 54,286 |
| Daily Register | 16 | 28,108 |
| Gloucester County Times | 16 | 28,107 |
| Vineland Times | 16 | 17,645 |
| Bergen Record | 15 | 150,885 |
| Trentonian | 15 | 68,035 |
| Ocean County Times | 15 | 26,178 |
| New Jersey Herald | 15 | 18,015 |
| North Jersey Advance | 15 | 15,527 |
| Star Ledger | 14 | 434,117 |
| Asbury Park Press | 14 | 125,659 |
| Atlantic City Press | 14 | 80,103 |
| Jersey Journal | 14 | 63,159 |
| Passaic Herald News | 14 | 61,066 |
| Home News | 14 | 55,451 |
| News Tribune | 14 | 53,404 |
| Paterson News | 14 | 48,441 |
| Hudson Dispatch | 14 | 34,965 |
| Morristown Daily | 13 | 59,037 |
| Today's Sunbeam | 13 | 10,199 |
| | | (Ayers Directory, 1985) |

Table 3: Readability Level versus Circulation

In order to determine the association between these two factors, we must create a bivariate table and then apply the chi-square test. For our purposes the grade levels were translated into difficulty levels, easy and difficult. Easy was defined as either 13 or 14; and difficult as 15 and 16. Circulation was divided into size categories, small and large. Small was defined as a circulation between 10,000 and 60,000 readers; and large as anything above 60,000 readers. The following table displays the intersection between the two variables. The readability level is the independent variable because it affects the dependent variable, circulation.

| Circulation | Readability Level: Easy | Hard | |
|---|---|---|---|
| Large | 5 (3.85) | 2 (3.15) | 7 |
| Small | 6 (7.15) | 7 (5.85) | 13 |
| | 11 | 9 | 20 |

Table 4: Bivariate Table--The Intersection of Variables

The numbers within each cell are the observed frequencies; we actually tallied our data and found that this was how the circulation and readability levels intersected. The number within each cell and then within each semicircle is known as the expected frequency of that particular intersection. It is obtained by multiplying the row total with its corresponding column total, and then by dividing this product by the number of items sampled, in this case twenty (Meyer, 1979). From Table 4 we see that of the newspapers with a large circulation, 71% were relatively easy to read, while 29% were relatively difficult. This supports the hypothesis which states that the easier something is to read, the number of people who read it will be larger. Similarly, of the newspapers with a small circulation, 46% were easy while 54% were difficult. This also supports the hypothesis in that the more difficult something is to read, the less people will want to read it. But let's complete the chi-square test for a more conclusive test of association.

The chi-square involves both the observed and expected frequencies as described before. For each cell of the table subtract the expected value from the observed value and square the difference; then divide this square by the expected value. Finally, sum up the results of each cell. This is the chi-square value (Meyer, 1979). In this case, the chi-square

value is 1.17. Determine the degrees of freedom in the table, which in this case is one, the number of rows less one multiplied by the number of columns less one (Meyer, 1979). Look on any chi-square distribution table. We will use the standard probability level of .05 (Pasha, 1986) and find that according to the table any value greater than 3.841 is significant. Since 1.17 is less than 3.841, the relationship between readability level and circulation is not significant (Pasha, 1986); this is to say that they are not related for other reasons than reasons of chance and chance is the reason for the percentages supporting the hypothesis as noted prior to completing the chi-square test. See Appendix B.

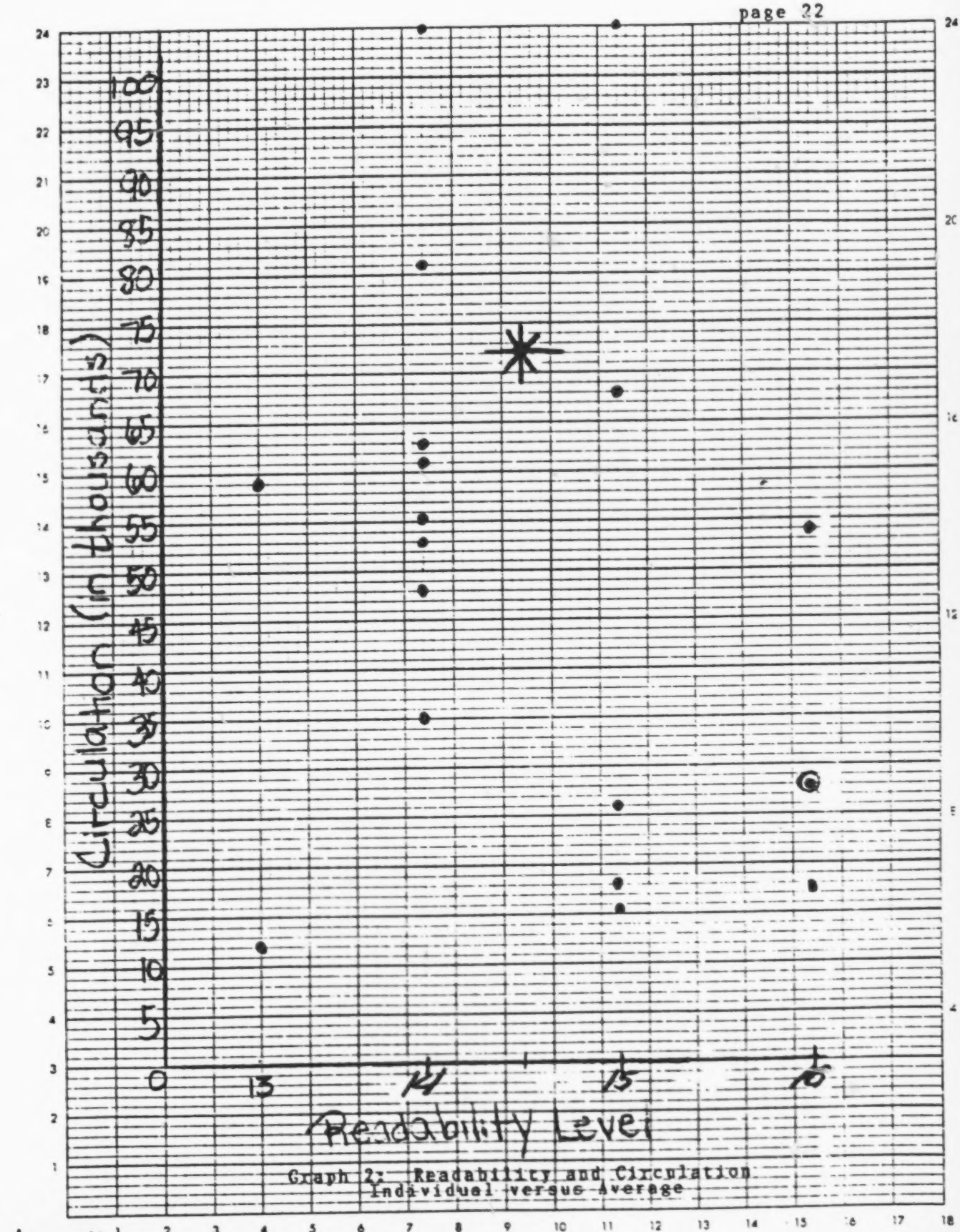
Following is an enlargement of the chi-square method. It offers additional support to this assertion that the relationship between readability and circulation is not significant. Columns 2 and 3 represent the values of readability level and circulation level, respectively, of each newspaper tested. These values are totaled and averaged, as seen at the bottom of each of the columns in the table. These values are used to find the variance and standard deviation of the two variables. See the following table.

| | Grade | Circulation | Grade$^2$ | Circulation$^2$ | Grade X Circulation |
|---|---|---|---|---|---|
| 1 | 16 | 54,286 | 256 | 2,946,969,196 | 868,576 |
| 2 | 16 | 28,108 | 256 | 790,059,664 | 449,728 |
| 3 | 16 | 28,107 | 256 | 790,003,449 | 449,712 |
| 4 | 16 | 17,645 | 256 | 311,346,025 | 282,320 |
| 5 | 15 | 150,885 | 225 | 22,766,283,225 | 2,263,275 |
| 6 | 15 | 68,035 | 225 | 4,628,761,225 | 1,020,525 |
| 7 | 15 | 26,178 | 225 | 685,287,684 | 392,670 |
| 8 | 15 | 18,015 | 225 | 162,405,225 | 270,225 |
| 9 | 15 | 15,527 | 225 | 241,087,729 | 232,905 |
| 10 | 14 | 434,117 | 196 | 188,456,267,338 | 6,077,638 |
| 11 | 14 | 125,659 | 196 | 15,790,184,281 | 1,759,226 |
| 12 | 14 | 80,103 | 196 | 6,416,490,609 | 1,121,442 |
| 13 | 14 | 63,159 | 196 | 3,989,059,281 | 884,226 |
| 14 | 14 | 61,066 | 196 | 3,729,056,356 | 854,924 |
| 15 | 14 | 55,451 | 196 | 3,074,833,401 | 776,314 |
| 16 | 14 | 53,404 | 196 | 2,851,987,216 | 747,656 |
| 17 | 14 | 48,441 | 196 | 2,346,530,481 | 678,174 |
| 18 | 14 | 34,965 | 196 | 1,222,551,225 | 489,510 |
| 19 | 13 | 59,037 | 169 | 3,485,249,295 | 767,481 |
| 20 | 13 | 10,199 | 169 | 104,019,601 | 132,587 |
| $\Sigma$ | 291 | 1,432,387 | 4251 | 264,788,433,106 | 20,519,114 |
| $\bar{X} = \frac{\Sigma}{20}$ | 14.55 | 71,619.35 | 212.55 | 13,239,421,655.3 | 1,025,955.7 |

Table 5: Enlargement of chi-square test

Finally, the information in the table is applied and a value is found for the correlation of the two variables. The resulting value is -.19. Since this number is negative, there is no relationship between circulation and readability. See Appendix C.

See the following graph to see how the actual values for each newspaper are distributed around the average for all the newspapers together.




Graph 2: Readability and Circulation
Individual versus Average

dis-pant

## DISCUSSION

Upon applying the readability formula, we come up with a result that denotes a nonsignificant relationship between readability level and circulation level. This means, in general, that people do not choose to read a newspaper based on the difficulty level on which the content is written. This goes against the original hypothesis which says that as a newspaper gets easier to read more people will read it and as it gets harder to understand less people will read it. This result supports the null hypothesis that readability and circulation are not inversely related. There are some limitations to this study, however.

It should be noted that the results of this study and the conclusions drawn from it apply only to the twenty newspapers that underwent the Flesch formula, after six were disqualified. These newspapers are not representative of any other newspapers and hence the results are not representative. Any conclusions which are drawn are applicable to twenty of the daily newspapers of New Jersey.

Another of the limitations of this study is related to the values of the individual newspapers as compared to the average of all of them. The problem stems with the circulation variable. Most of these values are in a range of twenty eight thousand and eighty thousand. But we then have the Star Ledger with a

circulation of over four hundred thousand. This is certainly out of the range of most of the other newspapers. This is damaging enough to an average, but take into account the next two largest newspapers in terms of circulation, The Bergen Record and The Asbury Park Press; both are over one hundred thousand. Then at the other end of the spectrum is Today's Sunbeam. With a circulation barely over ten thousand, it does not even approach the general range. While these are only four values out of twenty, they are so radical as compared to the other sixteen that their weight becomes tremendous. It is possible that they distorted the average when using the second method of correlation. For the most part, when plotted on the graph the individual pairs of coordinates of grade level and circulation are widely distributed around the average. See Graph 2. This distribution would not have been experienced in the chi-square method as seen in Table 4.

The following limitation is a result of both the Flesch and Fry readability formulas. Both are based on sentence and word length. They both go under the assumption that the longer the sentence, or the more syllables, prefixes and suffixes in a word the harder each is to understand. This is not always the case. L.A. Sherman, who back in the late 1800s held English literature seminars in order to measure style, raised an interesting question about sentence length. He said that "short

sentences are not necessarily easy to read because they are short. Nor are long sentences always heavy and obscure because they are long (Kearl, 1948)." Sherman added that "a long sentence is not so bad if it has a few verbs in it, but a long sentence made up of dangling phrases is hard to follow. This is a distinction that has been lost in modern readability formulas (Kearl, 1948)."

We find that both formulas are hampered by mechanical inflexibility, which may promote extremes. According to the formulas there is no acceptable range for sentence length, the shorter the better. Similarly, the shorter or simpler the words used, the better the score, which means the more readable the work (Kearl, 1948).

Then there is a problem with the score itself. This writer chose to limit the categories of news studied to hard news, local news and soft news. Each category consisted of four articles. So there was a total of three Flesch readability scores, one for each category of news. But then these three scores were averaged to obtain a score representative of all the news in individual newspapers. The problem does not lie in the fact that the scores were averaged as the score found by averaging was almost identical to the score obtained by applying the Flesch formula all at once to all the samples in that newspaper, regardless of the news category. The problem lies in the fact that

one score is being asserted as representative of all types of news. "Studies which report the readability of entire newspapers rather than types of stories may give a distorted view of their difficulty (Johns and Wheat, 1978)." Jerry Johns and Thomas Wheat performed a study in 1978 in an attempt to determine if there were significant differences in the readability of types of stories that would distort a value for an entire newspaper. They were particularly interested in political and sports stories. Johns and Wheat used the Fry and Dale-Chall formulas to obtain readability scores for each of their two variables. Their procedure up to this point is of the same principle that enabled us to obtain the values in columns 2,3 and 4 in Table 2. This is where their their study stopped; they were not interested in obtaining a representative score as can be found in our column 5 in Table 2. They were interested in comparing the values within each category. This could have a strong impact on the difficulty of the newspaper as perceived by the consumer. This would depend on whether the consumer were interested in a particular category of news.

Johns and Wheat found that political stories were significantly more difficult to read than were sports stories (Johns and Wheat, 1978). Our results are similar. We need to look at columns 2,3 and 4 in Table 2 individually. An average readability score was found for each; fifty-six for soft news, thirty-six

for local news and twenty-nine for hard news. Compare these scores with Table 1. Keep in mind that this example dealt with the averages of entire categories of news, but these averages are representative of their respective categories. Hard news in this case, according to Flesch's definition, has to be considered as being very difficult on the average; local news as difficult while soft news is the easiest of them all, with a label of fairly difficult. Compare this to the average overall score (the overall reading ease score for each of the newspapers as averaged together). The average, with a score of forty, is solidly set in the difficult category. This would equate with the average of local news pieces. So to delegate one value as being representative of all three news categories is inefficient as the actual scores are hidden and the overall value is distorted. In every instance, soft news--food, sports and entertainment--was much easier to read than either of the two other categories and in all but four instances hard news was the most difficult. This may sound as if the division between difficult is minute, but upon looking at column three in Table 1 we see that these divisions equate to grade levels.

We see that hard news was written on a college graduate level, local news was appropriate for people with at least thirteen through sixteen grade levels of schooling and soft news was readable to people with ten through twelve years of

education. This evaluation of difficulty and then of grade level becomes of questionable validity. All such evaluation is based on subjective value judgments. "There are no rigorous standards of just what is 4th grade difficulty as opposed to 5th grade difficulty (Fry, 1968)." This point questions the value of the numerical values as found in column 3 so we will use those values as values of ranking (Pasha, 1986).

But this qusetion as to the usefulness of assigning a grade level would have created a serious problem for Flesch. He originally created his formula with the intention of grading textbooks for children (Flesch, 1949). The ranking of textbooks in relation to each other was an important aspect of his formula, but the goal then was to assign these books to students with appropriated levels of education. This is where the problem of subjectivity surfaces once again. But even still, application of Flesch's formula to textbooks might be more appropriate than to newspapers. With the original purpose in mind, Flesch was dealing with a controlled population, students in a classroom for whom one teacher had to pick a textbook; now we are dealing with the competitive world of public information channels (Holcomb, 1954). This might explain why factors other than grade level are not taken into consideration; thus somewhat limiting the value of applying any readability formula to a newspaper.



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Competition is a stronger factor in the newspaper market than in the textbook market. "From the late 1850s until the 1900s the growth of the newspaper as the nation's only mass medium seemed to keep pace with increases in population (Fowler and Smith, 1979)." Then came the popularity of the magazine in the early 1900s, radio in the 1920s and television in the 1940s. The ratio of newspapers per household has continued to drop and since 1970 has averaged less than one subscription per household (Fowler and Smith, 1979), and this does not even take into account the decrease in circulation based on the increase in illiteracy (Jacobs, 1985). In short, newspapers must now compete for reader's time in a more crowded market than ever before (Jacobs, 1985), one in which television holds much of reader's time (Jacobs, 1985).

Competition is the basis of Fowler and Smith's statement that "readability is not the only means of increasing circulation nor does a more readable item necessarily cause people to read it (Fowler and Smith, 1979)." Just as an example, look at Table 3. The Courier News is one of the most difficult newspapers to read while Today's Sunbeam is one of the easiest. However, contrary to the hypothesis, the harder newspaper has a circulation which is larger than that of the easier newspaper (54,286 and 10,199 respectively). This suggests two bases for circulation other than readaability, population in a given circulation area and

availability of a newspaper. It stands to reason that only people in a certain area will read that area's paper. The larger the number of consumers to whom a newspaper is available, the larger the ratio of purchasers to nonpurchasers becomes a possibility and so too does the circulation become larger. But as that area becomes larger, so too does the number of available newspapers from which to choose. And this is when competition comes into play. With this inevitable factor of competition, the factors as listed by Holcomb, Kearl and Stevenson have to be acknowledged. They were correct in maintaining that circulation is a function of factors other than reading ease, at least in the case of the twenty daily newspapers of New Jersey.

Potentially correct is the assertion by Bryant Kearl and echoed by W.S. Gray and Bernice Leary that "it is a mistake to expect the scores produced by these formulas necessarily to correlate with actual readership. The formulas deal primarily with writing style and deliberately omit the study of content, format and organization, each of which is important to readability (Kearl, 1948)."

Also potentially correct is the assertion by Holcomb that "gimmicks" such as puzzles and astrological columns attract reader's attention (Holcomb, 1954).

Other factors could possible by individual interests of the readers and time constraints. But this report can't prove any

of these assertions, nor the presence of any of these factors. Interesting papers could be written controlling for these items. This paper can, however, supply evidence against Guido H. Stempel III's assertion that "the key to reaching more readers is making newspapers easier to read (Stempel, 1981)" The value of the hypothesis found at the beginning of this thesis has to be replaced with the assertion of the null hypothesis as it was favored the second the chi-square test yielded a verdict of not significant.

## Asbury Park Press

| | Hard News | AP | Local | Soft |
|---|---|---|---|---|
| average sentence length | 4 (25) | | 3 (37) | 6 (17) |
| syllables/100 words | 179/100 (179:100) | | 185÷112 (165:100) | 147÷102 (144:100) |
| average word length | 5 (20) | | 6 (17) | 5 (20) |
| syllables/100 wds | 179/100 (179:100) | | 184÷102 (180:100) | 159÷98 (162:100) |
| avg. sentence length | 4 (28) | | 4 (24) | (16) |
| syllables/100 wds | 188÷112 (168:100) | | 149÷94 (159:100) | 106÷110 (151:100) |
| avg. sentence length | 4 (25) | | 4 (26) | 5 (20) |
| Syllables/100 wds | 178÷99 (160÷100) | | 205÷105 (195:100) | 194÷100 (194:100) |

Avg sent Length
24.2
× 1.015
= 245

Number Syllables
176.5
× .846 = 149

add subtotals 174

206.835
− 174 (sub)
33

Avg sent Length
24.3
× 1.015
= 247

Number Syllables
174.75
× .846 = 148

add subtotals 173

206.835
− 173 (sub)
34

Avg sent Length
17.8
× 1.015
= 18.1

Number Syllables
162.8
× .846 = 138

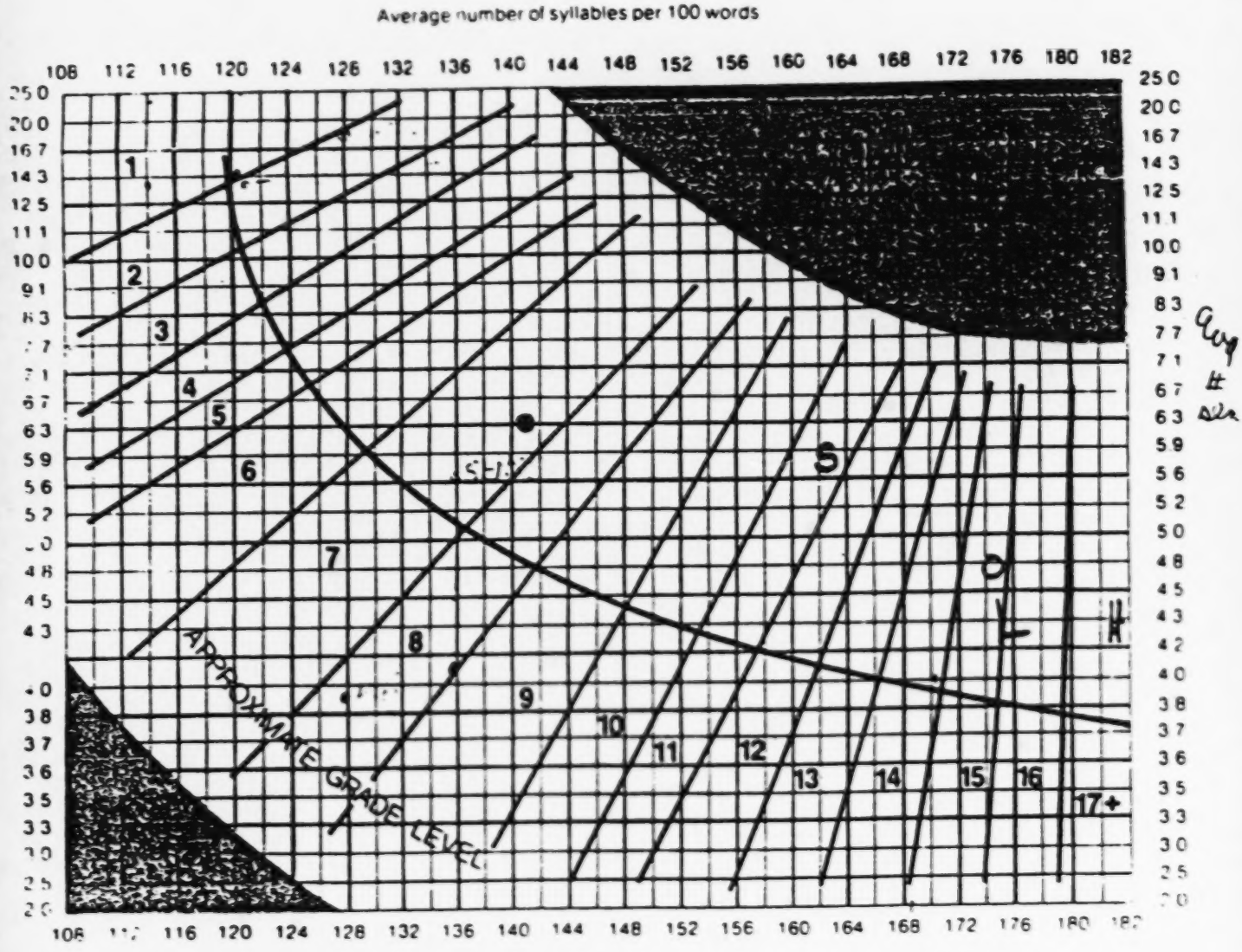
add subtotals 156

206.835 (sub)
− 156
51

Appendix A2

# GRAPH FOR ESTIMATING READABILITY – EXTENDED

by Edward Fry Rutgers University Reading Center New Brunswick N J 08904




Avg # sylls

H=hard words

## APPENDIX B

$\chi^2 = \sum \frac{(O-E)^2}{E}$

Cell A: $\frac{(5-3.85)^2}{3.85} = \frac{1.32}{3.85} = .34$

Cell B: $\frac{(2-3.15)^2}{3.15} = \frac{1.32}{3.15} = .42$

Cell C: $\frac{(6-7.15)^2}{7.15} = \frac{1.32}{7.15} = .18$

Cell D: $\frac{(7-5.85)^2}{5.85} = \frac{1.32}{5.85} = .23$

$\chi^2 = 1.17$

Degrees of Freedom: (rows - 1) x (columns - 1)

(2 - 1) x (2 - 1)

1 x 1

1

APPENDIX C

$\mu_{grade} = 14.55$

$\sigma^2_{grade} = 212.55 - (14.55)^2$

$= 212.55 - 211.7$

$= .85$

$\sigma_{grade} = \sqrt{.85}$

$= .92$

$\mu_{circulation} = 71,619.35$

$\sigma^2_{circulation} = 132394216553$

$-(71,619.35)^2$

$= 132394216555.2$

$- 5090656845.9$

$= 8,148,764,809.9$

$\sigma_{circulation} = 90270$

$Cov(grade, circulation) = [\Sigma(g \times c)] - \mu_c \times \mu_g$

$= 1025955.7 - 1042061.5$

$= -16105.8$

$P(grade, circulation) = \frac{-16105.8}{(.92)(90270)} \doteq \boxed{-.19}$

$83048.9$

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